IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCE

In re Application of	Confirmation No.: 6121
Yong Jae LEE	Group Art Unit: 1746
Serial No.: 10/721,247	Examiner: Jason Heckert
Filed: November 26, 2003	Customer No.: 34610
For: DISHWASHER	

APPEAL BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop Appeal Brief-Patents
Randolph Building
401 Dulany Street
Alexandria, Virginia 223134

Sir:

This appeal is taken from the rejection of claims 1-22 as set forth in the Final Office Action dated May 10, 2007 (hereinafter "Final Office Action"). In accordance with 37 C.F.R. §41.37, applicant addresses the following items.

REAL PARTY IN INTEREST

The real party in interest is the assignee, LG Electronics Inc. The assignment document is recorded at Reel 014744 and Frame 0581.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF THE CLAIMS

This is an appeal from the Final Office Action dated May 10, 2007 of claims 1-22. No other claims are pending. All pending claims 1-22 are rejected.

STATUS OF AMENDMENTS

All Amendments filed in this application have been entered. A copy of appealed claims 1-22 appears in the attached Claims Appendix.

SUMMARY OF THE CLAIMED SUBJECT MATTER

As stated in 37 C.F.R §41.37(c)(v), applicant is providing the following explanation of each of the independent claims involved in this appeal. This explanation refers to the specification and drawings. The following is merely an example summary and is not intended to be a discussion of the full and entire scope of the claims. Other interpretations, configurations and embodiments are also within the scope of the pending claims.

A. Independent Claim 1

Independent claim 1 recites a dishwasher comprising a housing, a tub in the housing to hold tableware, an injector assembly for injecting water on the tableware in the tub, and a water softener device for softening the water supplied to the injector assembly. The water softener device comprises a first container holding an ion-exchange resin for removing heavy metal and metal ions from the water, a second container holding a predetermined amount of salt and salt water to supply the salt water to the first container to recycle the ion-exchange resin that is saturated, a float installed in the second container, and a sensor provided to the second container to sense a concentration of the salt water based on a distance of the float from the sensor and generate a signal corresponding to the sensed distance. Referring, for example, to the exemplary embodiment shown in Figures 1-3B and discussed at pages 5-11 of the present application, a dishwasher 1 is shown and disclosed which includes a housing 10, a tub 20 disposed in the housing 10, an injector assembly 40, and a water softener device 100. The water softener device 100 includes a first container 110 holding an ion-exchange resin, a second container 120 holding a predetermined amount of salt and salt water, a float 131 installed in the second container 120, and sensor 132. The sensor 132 senses a concentration of the salt water based on a distance of the float 131 from the sensor 132 and generates a signal corresponding to the sensed distance. See, for example, page 9, paragraph [0035] of the present application.

B. Independent Claim 12

Independent claim 12 recites a water softener device for a dishwasher, the water softener device softening water supplied to an injector assembly of the dishwasher, the water softener device comprising a first container holding an ion-exchange resin for removing heavy metal and metal ions from the water, a second container holding a predetermined amount of salt and salt water to supply the salt water to the first container to recycle the ion-exchange resin that is saturated, a float installed in the second container, and a sensor provided to the second container to sense a concentration of the salt water based on a distance of the float from the sensor and generate a signal corresponding to the sensed distance. Referring, for example, to the exemplary embodiment shown in Figures 1-3B and discussed at pages 5-11 of the present application, a water softener device 100 is shown and disclosed which includes a first container 110 holding an ion-exchange resin, a second container 120 holding a predetermined amount of salt and salt water, a float 131 installed in the second container 120, and a sensor 132. The sensor 132 senses a concentration of the salt water based on a distance of the float 131 from the sensor 132 and generates a signal corresponding to the sensed distance. See, for example, page 9, paragraph [0035] of the present application.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1) The Final Office Action rejected claims 1-11 under 35 U.S.C. §103(a) as being unpatentable over Kendt, in view of Rak, and in view of Golladay et al. (hereinafter "Golladay").

2) The Final Office Action rejected claims 12-22 under 35 U.S.C. §103(a) as being unpatentable over Rak in view of Golladay.

ARGUMENT

A. Rejection under 35 U.S.C. §103(a) over Kendt, Rak, and Golladay.

1. Independent Claim 1

Regarding independent claim 1, the Final Office Action asserted that "Kendt discloses a dishwasher comprising a housing 11, a tub 12, a spray arm 34, and a water softener 30." The Examiner then acknowledges that Kendt does not disclose a water softener that "includes a float and sensor for sensing the concentration of salt water," but then asserts that Rak discloses such features. Further, the Examiner acknowledges that "[n]either Kendt nor Rak discloses a sensor that detects a distance from the float to the sensor," but then argues that Golladay discloses such features. The Examiner concludes that "[i]t would have been obvious at the time of the invention, to modify the dishwasher disclosed by Kendt, to include any water softener that was conventionally used, such as that taught by Rak with a float type salt sensor, in order to detect and alarm the user of insufficient brine concentrations," and that "it would have been obvious to modify Kendt and Rak and include a Hall-effect apparatus, as disclosed by Rak, such as one that measures a location, depth, or distance, as taught by Golladay et al. as it is a known type of Hall-effect apparatus."

However, Rak discloses a low salt level sensor and a method for detecting low salt levels. The low salt level sensor disclosed by Rak comprises float 48, magnet 50, shaft 52, and hall effect switch 54. Rak teaches that the low salt level sensor "comprises detecting means for determining whether the float has risen in response to the addition of a predetermined amount of water to a height that indicates that there is sufficient salt in the tank to ensure that an adequate brine can be formed." See col. 3, lines 18-32 of Rak. Rak further teaches that "[a]mong the many means which could be used are an arm attached to the float which throws a switch when the float rises sufficiently or a cable or string attached to the float and a switch." Id. Additionally, Rak teaches that "[t]he means could also be a photoelectric switch mounted in such a manner to detect whether the float has risen sufficiently." Id. Thus, Rak at least does not disclose or suggest a sensor that senses a concentration of the salt water based on a distance of the float from the sensor and generates a signal corresponding to the sensed distance. Rather, as acknowledged by the Examiner, Rak's "liquid sensing apparatus detects the brine concentration by determining if the float has risen to a certain height."

Golladay discloses a Hall effect liquid level sensing apparatus and method. Golladay teaches detecting a particular location of a magnet 21, 25 and float 19, 23 by interaction of a Hall-effect sensor card 29 with the magnets 21, 25. The device of Golladay includes a tank 1 and a transparent tube 15 vertically arranged in the tank 1. The Hall-effect sensor card 29 is mounted within the tube 15, and the floats 19, 23 are mounted slidably on the tube 15. Further, Goladay teaches that "[t]he weight per unit volume of the float 19 is chosen so that it will float at

the surface of the fluid 6 so that the level of the magnet 21 corresponds to the surface of the fluid 6. See col. 7, lines 65-69 of Golladay. Golladay further teaches that "[t]he weight per unit volume of the float 23 is chosen to be between the respective specific gravities of the fluids 6 and 8 so that the float will float at the surface of the fluid 8 in such a manner that the location of the magnet 25 will be at the interface 9." See col. 8, line 69- col. 9, line 4. Golladay teaches that the "Hall-effect sensor may be reciprocated within the hollow tube to sense the location of the permanent magnet and thereby the location of the float." See Abstract of Golladay; see also col. 8, lines 34-42. Thus, the location of the magnets 21, 25 corresponds respectively to the surface of fluid 6 and the surface of fluid 8 (i.e., the interface 9 between fluids 6 and 8). Further, the Hall-effect sensor card 29 senses the magnets 21, 25 when it is adjacent the magnets 21, 25. Golladay does not disclose or suggest a sensor that detects a distance from the float to the sensor, as asserted by the Examiner. Rather, Golladay requires a complicated mechanism shown in Figures 2-3 to determine how much of a tape 27 has been paid out from an accumulator 11 in order to relate electrical pulses emanating from the Hall-effect sensor card 29 to the level of the fluid 6 and of the interface 9.

In the Advisory Action, the Examiner alleges, referring to the Abstract, that "Golladay discloses a device that can sense a location and depth of a float, which are readable on a distance." However, as set forth above, the device of Golladay includes the tank 1 and the tube 15 arranged vertically within the tank 1. The floats 19, 23 with the magnets 21, 25, respectively, move up and down along the tube 15 according to the change of liquid level. See col. 8, lines 4-

9 of Golladay. The Hall-effect sensor card 29 is disposed within the tube 15 so as to reciprocate in a vertical direction. When the Hall-effect sensor card 29 moves to the floats 19, 23, it senses the locations of the floats 19, 23 by an interaction with the magnets 21, 25. See col. 8, lines 34-42 of Golladay. Therefore, although the device of Golladay can sense the depth of the floats 19, 23 which is then converted to a level of liquid in the tank 1, based on the sensed locations, such a depth is merely a distance from a certain reference position to the floats 19, 23, not a distance from the Hall-effect sensor card 29 to the floats 19, 23. Further, Golladay senses the depth based on the distance that the Hall-effect sensor card 29 travels to the floats 19, 23 within the tube 15. Since the device of Golladay moves the Hall-effect sensor card 29 directly to the locations of the floats 19, 23, there is no distance between the Hall-effect sensor card 29 and the floats 19, 23 when the device senses the depth. Therefore, Golladay fails to disclose or suggest a sensor that senses a concentration of salt water based on a distance of a float from the sensor and that generates a signal corresponding to the sensed distance, as recited in independent claim 1.

In Summary:

1) The Examiner acknowledges that Kendt does not disclose a water softener that "includes a float and sensor for sensing the concentration of salt water."

2) Rak discloses a detecting means that merely detects when a float triggers a switch, and thus, has risen to certain height (of the switch), as acknowledged by the Examiner.

3) Golladay merely discloses a liquid level sensing device that senses a location of a

magnet/float 21/19, 25/23, when a Hall-effect sensor card 29 is adjacent the magnet/float 21/19, 25/23, which is configured to float at a liquid surface.

Thus, none of the applied references discloses or suggest a sensor provided to the second container to sensor a concentration of the salt water based on a distance of the float from the sensor and generate a signal corresponding to the sensed distance, as recited in independent claim 1. Additionally, none of the applied references provides the requisite motivation for combining teachings as asserted by the Examiner, in particular, for modifying Kendt as modified by Rak to include the complicated liquid level sensing apparatus disclosed by Golladay.

Additionally, the Advisory Action refers to recent case law (in particular, KSR International Co.) in arguing that the grounds (i.e. suggestion or motivation) for combining or modifying references would be common sense to a person of ordinary skill in the art, as well as being provided in the references themselves. The Advisory Action then concludes that "common sense would have made it obvious to combine known salt concentration techniques, or specific gravity techniques [(i.e. Golladay)] with devices where knowing salt concentration is pertinent [(i.e. the device of Rak)]." However, as mentioned above, Golladay discloses a liquid level sensing apparatus and method, not a salt concentration sensing apparatus and method. Further, although Golladay mentions specific gravity, as set forth above, the specific gravity of the fluids 6 and 8 is chosen so that the floats 23 and 25 correspond, respectively, to the surface of fluid 6 and the surface of fluid 8 (i.e. interface 9), in order to sense liquid level. As is well known in the art, the concentration of a certain material in a liquid and the level of the same

liquid are physical properties which are fundamentally distinguishable from each other. For example, the concentration of a certain material in a liquid could be changed without an accompanying change in the liquid level. Further, liquids with different levels could have the same concentration of a material. In any case, the sensing of the level would not represent the sensing of the concentration, and likewise, the concentration would not be directly converted into the liquid level and vice versa.

Moreover, since Golladay is related to the sensing of liquid level, it teaches away from Rak, which is related to determining sufficient salt concentration. For the same reasons, if the liquid level sensing technique of Golladay were to be combined with the device of Rak, it would result in a non-workable combination for sensing sufficient salt concentration. Further, if the teaching (i.e. the liquid level sensing technique) of Golladay were to be modified to sense sufficient salt concentration, such a modification would render Golladay unsatisfactory for its intended purpose of providing an improved liquid level sensing apparatus and method, and it also would change a principle of operation of Golladay related with the liquid level sensing. Accordingly, there would have been no motivation to make the alleged combination of Golladay and Rak.

Furthermore, without considering the deficiencies in the disclosures of the applied references discussed above, a person of ordinary skill in the art would instantly recognize from the fundamental difference in properties (i.e. liquid level and salt concentration) to be sensed that the apparatus and method for sensing liquid level disclosed by Golladay would not be

combinable with the device for determining sufficient salt concentration disclosed by Rak based on common sense. Rather, contrary to the Examiner's assertion, it would definitely be common sense not to combine the teachings.

For at least these reasons, the proposed combination would not have been obvious to one of ordinary skill in the art not only in view of the teachings of the applied references, but also in view of the common sense of one of ordinary skill in art. Additionally, in light of the disclosures of the applied references and common sense, the proposed combination would have been obvious to one of ordinary skill in the art only after considering the teachings of the present application. Thus, it is clear that the Examiner utilized impermissible hindsight in rejecting the claims of the present application, and did not consider the invention as a whole.

For at least the above reasons, the applied references, taken alone or combination, fail to disclose or suggest all of the claimed features of independent claim 1, and in particular, a sensor provided to the second container to sense a concentration of the salt water based on a distance of the float from the sensor and generate a signal corresponding to the sensed distance, or the respective claimed combination of independent claim 1. Further, none of the applied references provides the requisite motivation for combining teachings as asserted by the Examiner, in particular, for modifying Kendt as modified by Rak, to include the complicated liquid level sensing apparatus disclosed by Golladay.

Accordingly, the rejection of independent claim 1 over Kendt, Rak, and Golladay should be reversed. Dependent claims 2-11 are allowable over Kendt, Rak, and Golladay at least for the

reasons discussed above with respect to independent claim 1, from which they depend, as well as for their added features.

B. Rejection under 35 U.S.C. §103(a) over Rak and Golladay

1. Independent Claim 12

Regarding independent claim 12, the Examiner asserts that Rak discloses all of the claimed features except "a sensor that detects a distance from the float to the sensor." However, as discussed above, Golladay does not disclose or suggest such features. In particular, Golladay does not disclose or suggest a sensor that senses a concentration of salt water based on a distance of a float from a sensor and generates a signal corresponding to the sensed distance. Further, neither Rak nor Golladay provide the requisite motivation for combining teachings as asserted by the Examiner, in particular, for modifying the low salt concentration sensor of Rak to include the complicated liquid level sensing apparatus disclosed by Golladay.

Accordingly, the rejection of independent claim 12 over Rak and Golladay should be withdrawn. Dependent claims 13-22 are allowable over Rak and Golladay at least for the reasons discussed above with respect to independent claim 12, from which they depend, as well as for their added features.

CLAIMS APPENDIX

The attached Claims Appendix contains a copy of the claims involved in the appeal.

EVIDENCE APPENDIX

Applicant has not provided any evidence with this appeal and therefore an Evidence Appendix is not provided.

RELATED PROCEEDINGS APPENDIX

Applicant is not providing copies of related decisions and therefore a Related Proceeding Appendix is not provided.

CONCLUSION

It is respectfully submitted that the above arguments show that each of claims 1-22 are patentable over the applied references. Based at least on these reasons, it is respectfully submitted that each of claims 1-22 defines patentable subject matter. Applicant respectfully requests that the rejections of claims 1-22 set forth in the May 10, 2007 Final Office Action be reversed.

Respectfully submitted,
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CLAIMS APPENDIX

1. A dishwasher, comprising:

a housing:

a tub in the housing to hold tableware;

an injector assembly for injecting water on the tableware in the tub; and

a water softener device for softening the water supplied to the injector assembly, the water softener device comprising:

a first container holding an ion-exchange resin for removing heavy metal and metal ions from the water;

a second container holding a predetermined amount of salt and salt water to supply the salt water to the first container to recycle the ion-exchange resin that is saturated;

a float installed in the second container; and

a sensor provided to the second container to sense a concentration of the salt water based on a distance of the float from the sensor and generate a signal corresponding to the sensed distance.

2. The dishwasher as claimed in claim 1, wherein the float fluctuates in height according to the concentration of the salt water.

3. The dishwasher as claimed in claim 1, wherein a guide for guiding floatage of the float is further provided in the second container.

4. The dishwasher as claimed in claim 1, wherein the float comprises a body and a magnet attached to the body.

5. The dishwasher as claimed in claim 1, wherein the sensor senses an amount of the salt in the second container according to the distance from the float.

6. The dishwasher as claimed in claim 1, wherein the sensor senses a shortage of the salt in the second container according to the distance from the float.

7. The dishwasher as claimed in claim 1, wherein the sensor generates a current if the distance from the float is smaller than a predetermined distance.

8. The dishwasher as claimed in claim 1, wherein the sensor generates a current to vary according to the distance from the float.

9. The dishwasher as claimed in claim 1, further comprising an information device informing the concentration of the salt water according to a signal generated from the sensor.

10. The dishwasher as claimed in claim 1, further comprising an information device informing a salt amount in the second container.

11. The dishwasher as claimed in claim 10, wherein the information device informs a shortage of the salt amount.

12. A water softener device for a dishwasher, the water softener device softening water supplied to an injector assembly of the dishwasher, the water softener device comprising:

a first container holding an ion-exchange resin for removing heavy metal and metal ions from the water;

a second container holding a predetermined amount of salt and salt water to supply the salt water to the first container to recycle the ion-exchange resin that is saturated;

a float installed in the second container; and

a sensor provided to the second container to sense a concentration of the salt water based on a distance of the float from the sensor and generate a signal corresponding to the sensed distance.

13. The water softener device as claimed in claim 12, wherein the float fluctuates in height according to the concentration of the salt water.

14. The water softener device as claimed in claim 12, wherein a guide for guiding floatage of the float is further provided to the second container.

15. The water softener device as claimed in claim 12, wherein the float comprises a body and a magnet attached to the body.

16. The water softener device as claimed in claim 12, wherein the sensor senses an amount of the salt in the second container according to the distance from the float.

17. The water softener device as claimed in claim 12, wherein the sensor senses a shortage of the salt in the second container according to the distance from the float.

18. The water softener device as claimed in claim 12, wherein the sensor generates a current if the distance from the float is smaller than a predetermined distance.

19. The water softener device as claimed in claim 12, wherein the sensor generates a current to vary according to the distance from the float.

20. The water softener device as claimed in claim 12, further comprising an information device informing the concentration of the salt water according to a signal generated from the sensor.

21. The water softener device as claimed in claim 12, further comprising an information device informing a salt amount in the second container.

22. The water softener device as claimed in claim 21, wherein the information device informs a shortage of the salt amount.

EVIDENCE APPENDIX

None provided.

RELATED PROCEEDINGS APPENDIX

None.